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Indigenous people and climate change

Causes of flooding in the Bolivian Amazon and consequences for the indigenous population

Gabriela Canedo Vásquez

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Consejo Latinoamericano de Ciencias Sociales - Conselho Latino-americano de Ciências Sociais
Executive Secretary Pablo Gentili
Academic Director Fernanda Saforcada

Estados Unidos 1168 | C1101AAX Ciudad de Buenos Aires, Argentina
Tel. [54 11] 4304 9145 | Fax [54 11] 4305 0875 |
<clacsoinst@clacso.edu.ar> | <www.clacso.org>

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The paper discusses the relationship between climate changes and indigenous peoples. To this aim we will focus our research on the effects of the rains in the Department of Beni (Bolivia). This region suffers "monsoon-like" attacks every year which manifest themselves in frequent rains, flooding and main rivers breaking their banks, resulting in extreme flooding. Nevertheless, the historical floods that occurred in 2014 were devastating.

We show that the main causes of the devastating floods are the climate change, deforestation and the overflow of two Brazilian dams, Jirao and San Antonio. We address the issue of the relationship between climate change and indigenous people from an anthropological perspective.

Our approach focuses on the land management and tenure, under two different activities (small scale agriculture and large scale livestock) that correspond to two different social groups (farmers and indigenous people) and to two different conceptions and ways of occupation of the same geographical space. Livestock is an activity developed by entrepreneurship farmers. Livestock go hand in hand with cutting down trees and forest burning (*chaqueo*), in order to enable large grazing areas. For farmers the land is there to take advantage of for the purpose of developing their economic potential in the market. For the indigenous peoples, territory and its intrinsic worth and broad understanding of this allows their subsistence and the development of their community life, and managing resources collectively. However they suffer the harshest consequences of the deforestation practices because they live by hunting, and small-scale agriculture; their economy is basically of self subsistence.

Bolivia is located in the heart of South America. The Department of Beni is part of the Amazon region of Bolivia. It has an extraordinary exuberance and a great variety of flora, fauna. This region is the home of 16 indigenous peoples. In summary, the grassland of Beni shows an interesting range of plant species and sub-formations, transforming it into a unique and valuable area.

Rains and floods are usual in this region, but this year (2014) rainfalls reported a historical increase in inland precipitation. The floods were unusual and the consequences tragic especially for indigenous peoples. Are complex social, economic and environmental interactions that determine the vulnerability of indigenous people and their resilience to natural disasters. These determinants are environmental degradation, poverty and social inequality.

Gabriela Canedo Vásquez: Sociologist and a PhD in anthropology from the Centro de Investigación y Estudios Superiores en Antropología Social (Mexico-DF). Author of "La Loma Santa una utopía cercada. Territorio, Estado y Cultura en la amazonía boliviana". And several articles on the Indian question, and territorial claim. Currently working in UNDP-Bolivia and teaches in the CIDES (Bolivia). gcanedovasquez@yahoo.com.

Social diversity and the presence of indigenous people in Beni

Currently Beni has a total population of 421,196 inhabitants. Although its reduced indigenous population, 16 of the 36 indigenous groups that inhabit Bolivia, are in this region.

Beni is anexcellent region for rearing livestock. Within the regional economic dynamics a division of activities among tow social groups:

- The farmers that developed large scale livestock and
- The indigenous people that developed small-scale agriculture and livestock that allow them to meet their subsistence needs.

We now focus on these two groups in order to see their relationship with land-territory. There is a conflict among them because of the land tenure rights and titles.

Indigenous groups and their concept of territory

The access to the property rights of indigenous territories in the Bolivian Amazon is irreversible. However, extreme poverty and neglect of this population will not change only by property entitlement.

The economic activity of self-subsistence that they develop through small-scale agriculture, hunting, and gathering, coupled with their social cohesion as indigenous communities makes the geographical space they inhabit, is conceived as a territory, the “big house “, “the mother “, that “unlimited” place “free “ walk ability, giving them food every day, and which defend against external actors such as farmers with whom conflicts over land ownership remain unresolved and latent. Thus we must understand that the effects of disasters caused by climate change (floods and droughts) affect them directly in their subsistent economy. Two aspects should also be emphasized; 1) the situation of constant conflict between farmers regarding the definition of property ownership in the same space; farmers claiming possession as individual property and the indigenous as collective; 2) Farmers carrying out activities such as *roza*, *tumba*, and burning which affect deforestation and which causes climate change and severe consequences on the indigenous population.

Ranchers and deforestation

The rearing of livestock is concentrated into large and medium-sized properties. Farmers practicing livestock rearing are interested in the land, and the highest proportion of it. There is therefore both a commercial and maximum exploitation of the land. So the practice of *roza*-and-burn activities of cultivated areas are activities that increase with the agricultural season, in order to induce the regrowth of grasslands to feed the cattle and the elimination of weeds, or with the aim of enabling more fields of grazing. Fire is a low-cost tool, widely used for the management of grasslands and is employed in economic activities on as large a scale as subsistence. In this way fires are started which become uncontrollable. Livestock remains one of the most important and direct causes of deforestation in the Amazon.

Historic Flooding in the Bolivian Amazon: Live it to tell it

Between November 2013 and February 2014 there were very heavy rains in the basin of the Beni River. Under such disastrous conditions, in February 2014 several municipalities in Beni called a hydrological red alert. By March 15th the water level was still rising.

In Beni alone there would have been 3,957 families affected, in addition to 140 hectares of crop losses and 218 families left homeless as a result of flooding.

In affected areas, the population is beginning to perceive a growing shortage of food and water, while being isolated in the Northern Amazon due to the bad state of the roads and highways. It was predictable that the prolonged flooding would generate outbreaks of disease, a change in soil composition, migration of animal species, and altering geography plus population displacement.

Causes of the flood

An already changing climate

Based on a study that takes the period between 2000 and 2011 it can be said that in Beni there has been an increase in total annual precipitation during the eleven years of study.

In Beni, an average of 59 days of rain/year in the 2000 was recorded. Climatic data shows a general trend of increase by 10 days of rain in the last 5 years.

Between 2000 and 2005 it rained 48 days on average, while between 2006 and 2011, it rained 58 days. 2009 was the year it rained more, recording a total of 72 days of rain. The number of days with thunderstorm there was little change during the eleven years of study, keeping close to the average, 37 days.

Moreover, the region is characterized by hot spots, which are related to deforestation. The department of Beni has the second largest number of hot spots in Bolivia during the dry season. Bolivia has the second most hot spots in South America; second only to Brazil.

In August 2009, Beni was the department with the highest incidence of hot spots in the country. The year 2010 ended with the declaration of an emergency zone for Beni due to the problems of drought and the fires that affected it.

Thus, we note that the flood of early 2014, an unprecedented extreme in history, has its roots in climate change and had been already manifesting itself in the first decade of the century.

Deforestation

Bolivia is the fifth country with most deforestation in the world. Deforestation and forest degradation occur in all forest ecosystems of Bolivia, especially in the Amazon.

In Bolivia , there is a deforestation rate of 350,000 hectares per year, and is the highest in the world, surpassing the levels of other major deforesting countries.

Brazilian dams

A third cause of the floods this year falls on the two mega-dams in Brazil, Jirau and San Antonio.

The floods caused by water retention in dams built in Brazil, and near the border with Bolivia, will have a permanent effect, causing further loss of forests, destruction of man-made infrastructure, impacts on livestock, flora, fauna and wildlife, and impacts on human life.

Consequences and conclusions

We began this paper by noting that the effects of climate change in the Bolivian Amazon have their cruelest repercussions on the indigenous population.

Amazonian families feed off birds and forest animals that are sources of protein of animal origin and complementary to nutritional needs vital for food security, and floods this year have caused the decrease of species as: jochi, fishing, the anta, the chancho de monte, the huaso, the kettle, etc.

Intermediate cities received the migration of rural residents affected by flooding and the outskirts of these cities are going to swell in numbers, increasing underemployment, forced labour, and begging, as in the case of migration of the Sirionós to the city of Santa Cruz to practice begging.

Approximately 5000 families across the region of Beni and the Northern Amazon have been left homeless.

400 to 650 fish species will go extinct, this is an ecocide. This is affecting the fishing capacity of the region and the livelihoods of local communities, who will have to change their diet. Potential impacts on human health and proliferation of malaria were also detected.

In short, the indigenous people of the Amazon cannot face extreme situations like the floods experienced this year. The facts show us that if their communities are flooded, they are virtually left with nothing; they are left with an empty pantry, living each day as it comes from nature.

In the Amazon, urges reducing deforestation because by its nature, forests provide important environmental services reducing the effects of climate change, maintain valuable biodiversity in the world of flora and fauna, and help to reduce global warming. These are the reasons why those actors who live off the land for commercial endeavors, should be regulated by the State with more drastic laws, otherwise the country is coming to go through episodes such as the beginning of the year.

Several forces are shaping the Amazon region. Persistent deforestation, land degradation, poverty, and violence regarding land appropriation. Thus, these aspects mark an inequality and in the context of disasters this becomes even deeper.